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BY WILLIAM COUPER, MONTREAL.

In a former paper, I have briefly referred to the peculiarity of nest structure made by the larvæ of our large Lepidopterous Nocturnal insects;* in order to show that an attempt should be made to separate species on the similarity of form and texture of these structures. No doubt, when Entomology becomes thoroughly studied throughout the Dominion, much of the confusion in our present generic classification will be removed by means of investigations into the early history of larvæ and imagines of the many genera. True, this may be pronounced a theory; but when I find

* Fitch, in his Report for 1859, gives some pertinent remarks regarding the nomenclature of *Attacus cecropia*. When Linnæus first noticed this moth in the cabinet of Queen Ulrica, it was at that time the largest and most sumptuous of the kind known to him, and he named it as above, but Sir James E. Smith and latterly Dr. Harris have stated that the Linnæan generic and specific nomenclature are inexplicable. Fitch adds that "the name *Attacus*, meaning elegant, or connected to the Athenians, was originally given by Linnæus to a section or sub-genus of his group BOMBYCIDÆ, having the wings expanded when at rest. Schrank afterwards gave the name *Saturnia* to the same insects. Germar subsequently revived the original Linnæan name, but most authors still continue the name proposed by Schrank. Duncan (Jardine's Naturalist's Library, vol. vii.) has recently proposed dividing these insects into quite a number of genera. Plain, and in the main judicious as his arrangement of them is, he, in our view, improperly ignores the name *Attacus*, and unfortunately gives an erroneous location to some of the species. Thus our American *Cecropia* and *Promethea* are the two species which he figures and fully describes as illustrating his genus *Hyalophora*, yet, as its name implies, this genus is characterised as having large hyaline glass-like spots on the middle of the wings. But no vestige of such spots exists in either of these species. The author has evidently been misled by figures, presuming the white spots represented in the centre of the wings to be hyaline, whereas they are opaque. A new situation must therefore be assigned to these two insects." Fitch further states that "*Cecropia*, *Promethea*, and the East Indian species named *Cynthia* of Drury, present a striking likeness to each other both in their preparatory and perfect states;" and he adds that "it is a remarkable feature in the Insect Fauna of this country that we possess such a number of large showy moths of the group *Attacus* of Linnæus. * * * * * we have in the State of New York alone eight of these elegant moths." At page 136 he remarks that our *Luna* "is almost identical with the

facts pointing toward these objects, I only ask the intelligent student to select a group for study, and when he concludes his investigations, let us have the matter fully explained. But before he can investigate cocoons or other nest forms of any particular genus, it is necessary that a collection be made of the various structures that contain either the living pupa or nymph. These should be preserved in separate boxes, and those specimens which his knowledge leads him to suppose belong to identified genera should be kept in such condition as to accord with the position in which he originally found them. This is the proper course to follow in investigating nest-structures of insects, which I claim will lead to the correction of many errors in our present classification, and place in their proper position many species that are now arranged under wrong genera. If this plan is carried out, the student will be rewarded with instructive lessons and discoveries of the greatest interest to science. This was the system commenced and partly worked out by the late lamented Benjamin D. Walsh, of Illinois, whose investigations of insect life were of the highest order; indeed, much of the present advanced state of the science in America is due to him. When my few illustrations and descriptions of insect architecture appeared in the *Canadian Naturalist*, he was the first to notice the matter and send me additional information regarding the species; and as I consider his remarks of value, I give them here as an addenda to said descriptions.

"No. 1 (see "Canadian Naturalist and Geologist," Dec. 1865, p. 461), except in being slightly smaller, strongly resembles the nest of *Eumenes fraternus* Say—a very common insect here. I have bred the female imago from the nest, and some that I broke open in the summer contained numerous green caterpillars, enough, I should judge, to feed the larvæ to maturity. I do not believe any wasps that are not social feed their larvæ after they are hatched out. The use of the short tube, which,

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Chinese species named *Selene* by Dr. Leach;" and regarding the *Polyphemus*, which is our most common species, he says that "it is remarkable that two insects which are so similar in their preparatory states that their larvæ differ only by slight and unimportant marks, and their cocoons cannot be distinguished from each other, still come to be so unlike each other in their perfect state as is *Polyphemus* and *Luna*. These facts show that the metamorphoses of the insects of this order are not so accurate a guide to their systematic arrangement as many have assumed them to be."

I have some reason, on another ground, to divide *Promethea* from *Cecropia* on cocoon form alone; and no doubt when the American species constituting the Linnæan genus *Attacus* are properly studied, great differences will be discovered, not only phytophagically but also in the internal structure of their larvæ.

when plugged up with clay, assumes the appearance of a button, is probably to prevent the caterpillars first enclosed in the nest from escaping before the full complement of food is made up."

"No. 2 (*Can. Nat.*, Dec. 1865, p. 461) is the nest of a wasp belonging to *Pompilidæ*, and differing from true *Pompilus* in having the front legs of the female nearly smooth. I have bred four or five different species from nests of similar structure, most of them found under dry bark, but one species occurring always under logs where the ground is moist. One of the former species is largely infested by an undescribed ichneumon fly belonging to the genus *Mesostenus*. The kind you figure is the smallest kind that I have bred from, some kinds being twice as long." In a subsequent communication, Mr. Walsh states that "the insect that forms the cell No. 2 belongs, I believe, to St. Fargeau's genus *Anoplius*; and on account of the legs being unarmed in the female he concludes it to be 'parasitic' in his sense of the term, or what Hartig calls an 'Inquiline,' and I have called in English a 'Guest-fly.' It is plain, however, that the reason why the legs of the female are unarmed is because it builds a clay nest and does not dig one out either in wood or in the ground. For the same reason, our common mud-wasp (*Pelopæus lunatus* Fabr.) has the legs of the female but very slightly armed with spines."

It will be seen from the above, that Mr. Walsh has bred four or five species belonging to the genus that produced my nest No. 2, and that the nests were all of similar structure.—but these species, he adds, differ from the true *Pompilus*, by having the front legs of the females devoid of spines. I am sorry that it is not in my power at present to obtain additional information regarding the species occurring in Canada; but it may be safely inferred that they do not belong to *Pompilus* proper. The habits of these insects differ, as he states, in that the majority of the species build under dry bark of trees, while one species constructs cells under logs, &c., in damp places. It may be found that this difference is a selection to suit the larva-food which may be of another kind from that found in the cells made under bark. Many of the mud-building wasps that construct dry cells provide their larvæ with caterpillars and spiders, which the parent insect stupefies with a kind of aculeate poison that keeps them fresh for many days. It is, therefore, probable that the similarly-formed cells found under logs in damp, muddy places, may be supplied with a larva-food requiring moisture to keep it fresh while the larvae are feeding.* It would please me greatly, if some young Entomological student of Ontario

* During the progress of these articles, it is my intention to make occasional remarks on the similarity of nests formed by Canadian Insects, embracing distinct genera in the

attended to this enquiry. The insect builds commonly in muddy places on river banks, such as the Don, near Toronto, and Rideau, near Ottawa, where I found the cells quite common in the autumn; but no doubt they can be found under logs near any of the smaller rivers in Ontario.

I pass now to another subject—The Report of the Fruit Growers' Association of Ontario, to which is appended a Report of some of the Noxious Insects of Canada. I am glad to notice that Ontario takes the lead in these useful and instructive matters: but what in the world are the Fruit Growers about in offering such large prizes for the dead bodies of so many specimens of *Conotrachelus nenuphar*? The Report states that thirteen persons collected last year 13,653 bodies of this weevil, for which the Association may have paid upwards of sixty dollars. Now, I ask any person who has studied this insect, or the habits of the family to which it belongs, if he discovered any natural check on its increase more than any other species of *Coleoptera*? During my residence in Ontario, I have not, but, on the contrary, know that they have a prolific year like every other creature on this earth. Well, say that next year will be its prolific year, what a drain would be made on the funds of the Association, provided a person was lucky enough to discover a metropolis of the insect, as I did several years ago at Toronto! They occupied a number of choke-cherry trees which grew on each side of the road that divided the Allan from the Ridout property, north of Queen-street. At the rate offered to-day by the Association for so many of their bodies, I could, at that time, have easily made twenty dollars per day. This weevil occurs on all cherry and plum-bearing trees growing in the wilds of the west; and I also found it destructive on the butternut growing in the Don valley, where it attacks the fallen fruit, in which it undergoes its changes within the decayed nut on the surface of the ground. I am afraid that this pest has too great a latitude in the west, and it will be difficult to lessen them until we are thoroughly acquainted with the various fruits and nuts which serve to propagate them; indeed, not even then can we be rid of them, unless attention is paid to the destruction of all the fallen fruits which are found under the trees on which they occur. *Conotrachelus nenuphar* does not appear to be very destructive to plum trees in the districts of Quebec, Montreal, or St. Johns, about twenty-seven miles south of this city, where plums are largely cultivated.

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present classification. Many of these species are considerably misplaced—according to my theory—but I am determined to make no statement that cannot be upheld by architectural form and structure.

The *Curculionidæ* are generally hardy insects, and widely distributed. Cold does not affect them much, as we find species recorded as inhabiting temperate zones, ranging and occurring abundantly in northern latitudes. I make a suggestion, which, if carried out, would greatly advance our knowledge of this extensive family, of which, I am sorry to say, we know little or nothing:—That each of the Coleopterists of Ontario devote a season to the study of at least one species of *Curculio*—first arranging, at a meeting of the Society or agreeing by correspondence, on the names of the species selected for study—that is, that an understanding may be had in order that everyone is to take up a separate species—each student to make a report to the Entomological Society of Ontario sometime in the autumn. Fitch, in his Report for 1859, p. 158, says that "we are not certain as to the species of weevil which produce the grubs in our American hazelnuts, walnuts and acorns." On the 31st March, I discovered the acorns of the white oak, growing on the Mountain near this city, to be infested with a Coleopterous larva. These acorns remained under the snow during winter, and I have no doubt that they will produce weevils. The larvæ, at the above date, were of three sizes, and quite vigorous. Color glossy white, the young purely so, but the larger specimens are dotted with numerous black dots arranged transversely on the segments. Head and thorax chestnut color, but in some specimens a black square internal spot occurs on the centre of the dorsal region; this spot has an inter-cutaneous movement when the animal creeps. When these acorns are examined, a small circular hole may be noticed on the side of the nut, made by the parent for the deposition of its eggs; but in many specimens the hole is so nicely closed by the larva from within, that it requires a very expert eye to detect the orifice. This is but one of the many curious stratagems described by Kirby and others. Some of the larvæ which I brought home have begun to spin silken cocoons within the acorns; and if I succeed in breeding this insect, the readers of the ENTOMOLOGIST will learn it in a future paper.

THE GOOD EFFECTS of Entomology are numerous: patience, perseverance, and punctuality are essential for successful collecting; memory, discrimination, and logical reasoning are necessarily cultivated; early rising is encouraged; the mind and body of youth find occupation; temptation to immoral pursuits loses its effect; and liberality with a desire to assist brother collectors is generally engendered, sometimes because it is pleasant, at others because it pays better than greediness.—*Knagg.*

HINTS TO FRUIT GROWERS.

Paper No. 3. By Wm. Saunders, London, Ont.

Figures Nos. 25, 26 and 27 represent the caterpillar, chrysalis, and perfect insect of the grape-vine sphinx, *Chærocampa pampinatrix*. The young larvæ, varying in color from green to pale lilac or red, are now (August 1st) very common, and may be easily recognised by reference to the figure; for although the ground-tint of the body may vary, the dots and lines remain about the same. Its habit, too, of drawing its head with the second and third segments into the fourth, gives it a distended appearance anteriorly which is very characteristic. When full-grown, the caterpillar is some two inches in length, green, and covered with many small yellow granulations. On the back is a row of seven dots, varying in tint from very pale lilac to red, and on each side of these there is a yellow line or stripe extending from near the head to the base of the caudal horn; while the sides of the body are striped obliquely with pale yellow. These caterpillars are great eaters; and did they appear in swarms, as is the case with many others, they would cause immense damage; but as the eggs are laid by the parent moth singly, and not often many on the same vine, the rapid growth of the foliage during the warmer months will, on a large vine, almost make up for any defoliation caused by this larva. In young vineyards or gardens where the vines are small serious injury is sometimes done by these voracious creatures, one of which, when nearly full-grown, will strip a young vine clean of all its foliage in two or three nights.

We know of no readier way of fighting this foe than by hand-picking. When the foliage is sparse, the destruction they cause will lead to their ready detection, and where it is dense, they may be discovered by their large dark brown castings on the ground under the vines on which they are feeding.

Nature, which is seldom at fault, has provided a remedy to supplement man's agency in the shape of a friendly parasite, a small fly, which is shown here both magnified and of its natural size (see fig. 28), and whose progeny feed within the bodies of their victims, and finally destroy them. Before attaining full growth in these instances, the larvæ usually begin to look sick, and there is a sluggishness apparent in their movements, when soon the body becomes covered with little oval white cocoons, formed by the young grubs

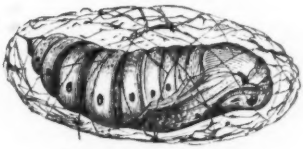
Fig. 28.

Color black.

FIG. 25.

Colors green, yellow and lilac.

FIG. 26.



Colors yellowish and brown.

FIG. 27.

Colors olive green and grey.

which have eaten their way out through the skin of their victim (as shown in fig 29), from which, in about a week, the little flies escape, bent on their errand of mercy to the vine-grower. Discriminate here between friends and foes, and never destroy an infested larva.

FIG. 29.

Should all things work smoothly with the caterpillar, its life-history not being interfered with by either parasites or vine-growers, then, when full-grown, it descends to the earth and constructs a slight cocoon, by drawing loosely together a few leaves or other material and binding them with silken threads, in which in three or four days the change to chrysalis (see fig. 26) takes place, and which finally gives birth to the beautiful green moth shown in fig. 27. For further details regarding this insect in all its stages, the reader is referred to "The First Annual Report on the Noxious Insects of the Province of Ontario," which appeared in the Report of the Commissioner of Agriculture for 1870.

THE FALL WEB WORM.

A serious pest just now affects the apple tree—I refer to the "fall web worm," *Hyphantria textor*, an insect which has found its way into this Province from the Eastern States within a few years past, and is rapidly spreading. It is by no means confined to the apple, but is equally destructive to the cherry—we have also occasionally found it on the blackberry as well as on several different kinds of forest trees. At a distance, it appears as if the tree or branch infested had been suddenly blighted, the leaves have such a scorched and withered look; but on closer inspection you find the branches enclosed in a slight silken web, by means of which many of the leaves are drawn towards the stem. The upper surface and pulpy portion of the withered leaves have already been consumed by this spoiler; and here and there, where some green portions still remain, groups of ever-hungry, hairy caterpillars are busy at work. In June or July, a small, pure white moth, or miller, has laid a cluster of eggs on a leaf near the extremity of one of the branches, and from this has originated the host of mischief-makers. Before attaining full growth they give up their social characteristics, and scatter far and wide, feeding singly on almost anything they meet with. When mature, they are a little more than an inch long, of a bluish black color, with a wide band of a paler hue along each side, and a few clusters of whitish or reddish hairs arising from little knobs or tubercles, which are arranged

in a transverse row on each segment or ring of the body. They are of very active habits, running briskly when disturbed.

Hand-picking is the best remedy for these also: go carefully over the infested branches and give no quarter.

REARING BUTTERFLIES FROM THE EGG.

By W. H. Edwards, Coalburgh, West Va.

I give herewith the conclusion to my experiments with *Ajax* and its varieties. The *Telamonides* larva spoken of in my communication of 27th Feb. (vol. ii., p. 163) as having lived over the winter, on the 1st of April, 1871, produced male *Telamonides* (all the rest had yielded *Marcellus* in 1870). The *Marcellus* larvæ were mostly lost at the burning of my house in February, but one was saved and yielded *Telamonides* female on the 10th of April, 1871.

We have a third well-marked variety very nearly the same as that figured by Abbot, and for convenience I designate this as "*Ajax* var. *Walshii*." It is the earliest of the species in the spring. On the 10th of April last I confined three females of this variety, and from them obtained 125 eggs, which in due time gave me 70 chrysalids. From these emerged, between the 1st and 6th of June, 22 male and 34 female *Marcellus*, 1 male *Walshii* and 1 male *Telamonides*. On the 23rd of June, another female *Marcellus* emerged, and still another on the 12th of July. The rest of the chrysalids are alive at this date.

On the 4th day of June last, I took two female *Interrogationis* fluttering about my hop vine, and enclosed them in a keg which was covered with a cloth and placed over a portion of the vine. They immediately began to lay eggs, and from them I obtained 38 larvæ, which, as they hatched, I transferred to a breeding case in the house. From these larvæ I had 18 chrysalids. Between the 3rd and 9th of July emerged therefrom 5 males and 6 females of *Interrogationis* (black-winged), 1 male and 5 females *Fabricii* (red-winged), and one died. The larvæ exhibited every distinct type of coloration that I have hitherto noticed in these forms, and either type of larvæ produced either sex or form of butterfly indifferently.

In part ix. of the "Butterflies of N. A." (to appear in October), 3 plates will be appropriated to the three varieties of *Ajax*, and 2 to *Interrogationis* and its variety *Fabricii*, with detailed statements of my experiments and observations.—July 13, 1871.

ENTOMOLOGICAL PICNIC.

THE members of the London Branch of the Entomological Society of Ontario held their annual picnic at Maple Grove Fruit Farm, the property of Mr. W. Saunders, on Wednesday, July 26th. They assembled at 1 p.m., and were conveyed in vehicles to the place of rendezvous. The day was fine, and although the bright sunlight brought heat in its train, it was so tempered by a refreshing breeze as to make the ride quite enjoyable.

On arrival at the grounds the party, which numbered about 40, soon distributed themselves among the small fruits. The raspberries being in season attracted the most attention. The *Philadelphias* were still heavily laden with well-ripened berries, and the *Doolittle* and *Mammoth Cluster* black caps, although past their prime, added to the enjoyments of the occasion. The assembled representatives of Entomological science were expected to do double duty, and while freely partaking of Nature's bountiful and refreshing gifts to take note of such insect enemies as affected the raspberry both in fruit and foliage. The programme in this respect was found impracticable, and it was unanimously decided by the parties concerned that to do one thing at a time and do it well was the most sensible way of proceeding; so the few insects abroad were allowed to retain peaceable possession until the gastronomic requirements of the company were met. Among the red raspberries, the black caps and the well-ripened gooseberries—of which there was an abundance—the various groups into which the party was divided feasted until small fruits ceased to be attractive, when a line of march was formed to the picnic ground, at the back of the farm, where numerous baskets containing hidden treasures had already been conveyed.

The route lay through the plum and pear orchards—the former containing 500, the latter over 1700 trees, most of which are now three years planted. We observed that some of the dwarf pear trees were already fruiting. The vinery, containing over 1000 vines, two or three hundred of which were in bearing, next claimed attention: the Concords were especially admired for their vigorous appearance and large, well-filled clusters of grapes. The trees in the cherry orchard, numbering over 300, were now in order; and these, although young, appeared remarkably thrifty and healthy, and promise well for fruit another season. Behind and at one side of the last mentioned is an

extensive apple plantation of nearly 2000 trees, a large proportion of which are now two years planted and growing well. A few of the more zealous members had their nets, pill boxes, &c., with them, but there were not many insects astir, and the trees and vines were remarkably free from caterpillars, so that but few captures were made in the orchards.

On the grassy sward, under the shade of a handsome group of maples, the company finally rested; and here, on the extended table-cloths was soon spread a tempting display of the choicest viands, furnished by the various members of the party, and supplemented by a profusion of raspberries and cream, the product of the farm, all tastefully arranged. After feasting well on these "good things," the members set off in skirmishing order and scoured the adjoining woods and fields in search of insect game, and some good captures were made. There were a few dragonflies and butterflies on the wing, which were energetically chased with but limited success; but small moths were more common and easily caught. The Coleopterists did better, and numberless logs were turned over and many a decaying stump barked to disclose the hiding places of the interesting objects of their search. A list of the captures will be found appended.

After a hunt of an hour or two, the company re-assembled and enjoyed the cool shade and the cooler ice-cream, and spent awhile in comparing captures and in social converse. On motion, all the collectors willingly handed over the results of the afternoon's hunt to the Secretary to be deposited in the Society's cabinet. By and by the setting sun gave warning of the approaching shades of night, and after votes of thanks to their courteous host, who had so kindly placed his grounds at the disposal of the Society, and to the ladies and others who had so materially aided in making the gathering such a pleasant one, the members left for their homes, all agreeing that the occasion had been one of the most agreeable reunions ever held under the auspices of the Society.

Among the captures of Lepidoptera, we observed the following species:—Polyommatus Americana; Drasteria erechthea; Heterophleps triguttata; Ebulea tertialis; Lithocolletis multipunctella; and a number of other "Micros" unknown to us, that would, no doubt, have charmed our friend, Mr. Chambers. Of the Coleoptera, the following may be mentioned:—Chlænius lithophilus and pensylvanicus; Platynus longicor-

nis and cupripennis; Pterostichus stygicus; Hydrophilus glaber; Staphylinus violaceus; Brontes dubius; Osmoderma scabra; Lachnosterna fusca; Penthe obliquata; Nyctobates pensylvanica; Dendroides Canadensis; Melandrya striata; Centronopus calcaratus; Dacne heros; besides a number of minute species that we have not yet had time to determine.

EXTRACT FROM MR. BENTHAM'S ANNIVERSARY ADDRESS TO THE LINNEAN SOCIETY.

We have ventured to reprint the following extract from Mr. Bentham's address, feeling sure that it will be read with great interest by all students of Entomology in this country.—Ed. C. E.

There is no country, however, in which the native Flora and Fauna has been so long and so steadily the subject of close investigation as our own, nor where it continues to be worked out in detail by so numerous a staff of observers; . . . but the Entomological Fauna of our country, especially in relation to the insects of the adjoining Continent, notwithstanding the numerous able naturalists who devote themselves to its study, appears to be somewhat in arrear.

In answer to my query as to works where our Insects are compared with those of other countries, I have received from our Secretary, Mr. Stainton, the following reply:—"The questions you have put to me with reference to our Entomological literature are very important; they, however, painfully call my attention to the necessarily unsatisfactory nature of my replies. Wollaston's 'Coleoptera Hesperidum' is the only separate work to which I can direct your attention as giving the fauna of a particular district, with the geographical range of such of the species as are likewise found elsewhere. R. M'Lachlan, who in 1865 had published (Trans. Ent. Soc., ser. 3, v.) a Monograph of the British Caddis-flies, gave, in 1868 (Trans. Ent. Soc. for 1868), a Monograph of the British Neuroptera Planipenna, but little is there said of the European range of our species. In 1867 (Entom. Monthly Mag., iii.) Mr. M'Lachlan, who is one of our most philosophical writers, gave a Monograph of the British Psocidæ, and he there says, with reference even to their distribution in our own country, 'As a rule, I have not mentioned special localities; these insects have been so little collected that an enumeration here of known or recorded localities would probably appear ridiculous

in a few years.' The Rev. T. A. Marshall has given (Entom. Monthly Mag., i. to iii.) an essay towards a knowledge of the British Homoptera, in which occasionally allusion is made to the European distribution of our British species.

"The position of the Insect-fauna of Britain may be thus stated: the late J. F. Stephens commenced in 1827 a systematic descriptive work of all the orders of British Insects as 'Illustrations of British Entomology;' it ceased to appear after 1835, until a supplementary volume came out in 1846. The Lepidoptera, Coleoptera, Orthoptera, Neuroptera were wholly, the Hymenoptera partly, done, the Hemiptera and Diptera altogether left out. In 1839, Mr. Stephens published, in a more compendious form, a 'Manual of British Beetles.' In 1849, an attempt was made to supply the gaps in the British Entomology left by Stephens, and a scheme of a series of volumes called 'Insecta Britannica' was elaborated, in which Mr. F. Walker was to undertake the Diptera, Mr. W. S. Dallas the Hemiptera, and great progress having been made in our knowledge of the smaller moths since 1835, I undertook to write a volume on the Tineina. This scheme was so far carried out, that three volumes on the British Diptera by Mr. F. Walker (assisted by the late A. H. Haliday) appeared in 1851, 1852 and 1856, and my volume on the British Tineina in 1854. In 1859, another great group of the smaller moths was described by S. J. Wilkinson in a volume entitled 'The British Tortrices.' The British Hemiptera, not having been done by Mr. Dallas, were undertaken by Messrs. Douglas and Scott for the Ray Society; and in 1865 a 4to volume was issued, containing the Hemiptera, Heteroptera, leaving the Homoptera for a second volume, still in progress. Even in this elaborate work little or nothing is said of the geographical distribution out of Britain of our British species. The same will apply to the late J. F. Dawson's 'Geodephaga Britannica,' published in 1854; to Westwood's 'Butterflies of Great Britain,' published in 1855; and to E. Newman's 'Illustrated Natural History of British Moths,' published in 1869.

"I believe I do not at all exaggerate if I say that for many years Entomology was pursued in this country with an insularity and a narrow-mindedness of which a botanist can scarcely form a conception. The system of only collecting British Insects was pursued to such an extent, that it was almost a crime to have a non-British insect in one's possession; if accidentally placed in one's cabinet it might depreciate the value of the entire collection, for Mr. Samuel Stevens can assure you that the value of the specimens depends very much upon their being indubitably

and unmistakeably British. A specimen caught in Kent which would fetch 2*l.* would not be worth 2*s.* if caught in Normandy. I satirised this practice several years since in the 'Entomologist's' Weekly Intelligence' (vol. v. and 1858, articles 'Jeddo' and 'Insularity'), but it is yet far from extinct."

Perfectly concurring in Mr. Stainton's observations in the last paragraph, I would, however, add, that there are purposes for which a local or geological collection distinct from the general one may be of great use, and such a collection would be much impaired by the introduction of stray foreign specimens. In a local museum, a separate room devoted exclusively to the productions of the locality is very instructive with reference to the history of that locality, and I have seen several such spoiled by the admission of exotic specimens, giving the visitor false impressions, which it takes time to remove. But it is never from such an exclusive collection that the fauna or flora of the district can be satisfactorily worked out, or that any branch of Zoology or Botany can be successfully taught.

Mr. Stainton adds: "It has been suggested to me that those who have critically studied the distinctions between closely allied species have rarely the time to work out in addition their geographical range, and that those who might work up the latter subject might fail in their good intentions for want of a proper knowledge of species." Upon this I would observe that, in the due appreciation of a species of its limits and connections, its geographical range and the various forms it assumes in different parts of its area are an essential element; and it appears to me that the neglect of this and other general characters is one reason why many able naturalists, who have devoted their lives to the critical distinction of races of the lowest grades unduly raised to the rank of species, have really contributed so little to any science but that of sorting and naming collections. On the other hand, the study of geographical range without a proper knowledge of species is little more than pure speculation. Division of labour carried too far tends to narrow the mind, and rather to delay than advance the healthy progress of science.

Mr. Stainton informs me that "there has just appeared a monograph of the Ephemeridæ, by the Rev. A. E. Eaton (Trans. Entom. Soc., 1871), treating of those insects throughout the globe; and when any species are noticed which occur in this country, their entire geographical range is noticed. It is altogether a valuable paper, on account of the thoroughness with which it seems to be done."—*Nature*, July 6, 1871.

NOTES ON THE EGG AND YOUNG LARVA OF ALARIA FLORIDA.

BY W. SAUNDERS, LONDON, ONT.

On the 4th of July I found a number of eggs of this beautiful moth on the evening primrose, *Œnothera Lamarckiana*. They were found attached to the stalks of the young flower buds; to the sides of the calyx of the flower, and also to the young leaves at their base. The eggs were quite firmly fastened among the long stout hairs with which the cuticle of the calyx and flower stalk is covered.

Description of egg examined under a magnifying power of 45 diameters:—Length, 1-40th of an inch; width, 1-45th. Form nearly round, flattened a little at the base, where it is also somewhat contracted in size, and slightly conical above, with numerous raised striæ, about 36 in all, which run into each other before they reach the tip, where they are reduced to less than half the number, and terminate at the base of a small ring which crowns the tip: this ring has a depression in the centre, and the space around the cavity is finely punctured. The striæ are irregularly crossed by numerous fine, raised lines, and thus the whole surface is minutely reticulated, but the meshes are irregular in form, with a slight depression in the centre of each. The color of the egg is dull yellowish pink.

Some of the eggs hatched on the 7th of July, when the following description of the young larva was taken:—

Length, about 1-15th of an inch, cylindrical. Head large, and black, with a few black and brown hairs. Body above of a dull shining yellow, with a wide dorsal band of dull white. On each segment there are from 8 to 12 shining black dots, from each of which arises a single black or brown hair. The upper portions of second and terminal segments have each a large patch of black.

Under surface similar to the upper, but with fewer dots; feet black; prolegs pale greenish, faintly tipped with brown.

The changes in appearance of the larva at its subsequent moultings were not noted. A description of the full-grown caterpillar has already been given in the ENTOMOLOGIST (see p. 6, vol. 2).

BOOKS RECEIVED.

Record of American Entomology for the Year 1870. Edited by A. S. Packard, Jr., M.D. Naturalists' Book Agency: Salem, 1871. (8vo. pp. 27. 50 cents.)

We have recently received a copy of the "Record" for 1870. It is, we regret to observe, less than half the size of the preceding issue; but, as the Editor observes, "we are not to infer that Entomology is on the decline in America; for there are many indications beneath the surface that promise much for the future of this study." There are references in this part to the notes or articles of thirty-five Entomologists, including six Canadians and five others who have contributed to the pages of the Canadian Entomologist, and to the descriptions of three hundred and one new species of North (and Central) American Insects that have been published during the past year. We regret exceedingly to learn from Dr. Packard that this useful publication is not being supported by American Entomologists in any degree as it ought to be, and that, unless an improvement takes place, it must be discontinued. Up to July 22 only *three* subscriptions had been received for the "Record" of 1870! This surely is a sad disgrace to the students of this branch of Natural History; but we trust that the mere mention of it will be sufficient to cause them to send in their subscriptions at once to the Naturalists' Book Agency at Salem, and relieve the hard-working Editor of further pecuniary responsibility. The price of the present issue is only fifty cents, while a complete set of the issues for 1868, 1869 and 1870 will be furnished for the small sum of a dollar and a half.

Third Annual Report on the Noxious, Beneficial, and other Insects of the State of Missouri. By Charles V. Riley, State Entomologist. Jefferson City: H. Willcox. 1871. (8vo. pp. 183.)

The first sixty pages of this valuable Report are occupied by an elaborate and most useful account of the species of *Curculionidæ* that are very injurious to fruits and vegetables, together with notices of their parasites and the best means of combatting their ravages. Then follow descriptions of eleven different insects that are injurious to the grape-vine; and notices of the Colorado Potato Beetle, the Apple Codling Moth, the Corn-worm, the Fall Army-worm, the Apple-tree and the Forest Tent Caterpillars, the Fall Web-worm, the Blue-spangled Peach-worm, and the Ash-gray Pinion; a description of the Glassy-winged Soldier-bug, a new friend to the grape-

grower; an account of the White-lined Morning Sphinx; and an interesting article on the Archippus Butterfly and its mimic, the Disippus. We give a full list of the contents of this volume in order to show our readers how replete it is with valuable and interesting matter, whether regarded in a scientific or economic point of view, and whether referred to for information on the common pests of our gardens, or as a contribution to the Darwinian controversies of the day. The whole volume, we must not omit to add, is handsomely illustrated with over seventy of Mr. Riley's admirable drawings. The following new species of insects are described and figured in the course of the volume:—Coleoptera, *Analcis fragariæ*, *Bruchus fabæ;* Lepidoptera, *Amphipyra conspersa*, *Xylina cinerea;* Diptera, *Tachina archippivora:* Hymenoptera, *Porizon conotrachela*, *Microgaster limenitidos.*

First Annual Report of the Geological Survey of Indiana, 1869. By E. T. Cox, State Geologist.

We are much indebted to Dr. G. M. Levette for these two handsome volumes.

Embryological Studies on Diplax, Perithemis, and the Thysanurous Genus Isotoma. By A. S. Packard, jun. Salem: 1871. Being the Second Memoir of the Peabody Academy of Science.

A valuable contribution to Embryology, very handsomely printed and illustrated by three excellent plates, besides several woodcuts.

Second and Third Annual Reports of the Trustees of the Peabody Academy of Science for the Years 1869 and 1870. Salem: 1871.

The Butterflies of North America: with Colored Drawings and Descriptions. By Wm. H. Edwards. Philadelphia: The American Entomological Society, Jan., 1871.

This magnificent work has now reached its seventh part, and shows no signs of falling off either in the beauty or excellence of its plates or the value of its letterpress. All Entomologists who can possibly afford it, ought to be subscribers; they will find the reception of each new number a source of intense delight, somewhat similar to that experienced upon the capture of a new or rare species. The eighth part, Mr. Edwards informs us, will be ready in a few days; the last plate is now in the hands of the colourist.

On Asymetry in the Appendages of Hexapod Insects. By S. H. Scudder and Edw. Burgess. Boston: 1870.

THIS essay treats especially of the Lepidopterous genus Nisoniades, and is illustrated by a large plate.

Catalogue of Coleoptera and Lepidoptera. By Geo. Dimmock. Springfield, Mass.: April, 1871.

Catalogue of Canadian Birds, Insects and Squirrels, collected in the vicinity of Toronto, by Dr. A. N. Ross. 1870.

Proceedings and Transactions of the Nova Scotian Institute of Natural Science. Vol. ii., part 4, May, 1870.

CONTAINS many interesting articles, and a complete index to previous volumes.

MISCELLANEOUS NOTES.

LEPIDOPTERA FROM FLORIDA.—We have received a small collection of Lepidoptera from Mr. Joseph E. Chase, Holyoke, Mass., that were taken in the State of Florida; it has afforded us pleasure to identify them for him. No. 1, *Enyo lugubris*, Drury; the larva is said by Dr. Clemens to feed upon the common Virginian Creeper; we may hope, therefore, to find this Sphinx in Canada, as its food-plant is very abundant. No. 2, *Agraulis vanillæ* Linn.—two specimens. No. 3, *Terias lisa* Boisd.—has occasionally been taken in Canada. No. 4, *Junonia cœnia* Hubn.—also occasionally found in this country. No. 5, *Pieris menusta* Godt. (*P. cleomenes* Boisd. and Lec.); a male and female, the latter distinguished by the smoky colour of its under surface. No. 6, *Callidryas cubule* Linn.—a pair; the male may be distinguished from the female by the lovely immaculate yellow colour of its upper surface. No. 7, *Papilio thoas* Linn.—taken occasionally in Canada. No. 8, *Chærocampa tersa* Linn. No. 9, *Melitæa* —— ?—a species quite new to us, and probably undescribed.

PERSONAL.—We very much regret to learn, from the communication of our esteemed correspondent, W. H. Edwards, Coalburgh, West Virginia, contained in the present number, that his dwelling has recently been consumed by fire, and with it some portion of his Entomological material. We sincerely hope that he succeeded in saving his valuable collection of Lepidoptera.—ED. C. E.

REMITTANCES RECEIVED SINCE ISSUE OF No. 2, Vol. III.

Mus. Com. Zoo., Cambridge, Mass., $8 ; Dr. S. V. S., St. Louis, Mo., $1 ; M. M. Kirkwood, Mo., $1 ; Quebec Branch, $10 ; J. G. B., Quebec, $2.76 ; H. L. M., Malden, Mass., $1 ; T. S., New Aberdeen, Ont., $1 ; W. C., Hespeler, $1 ; A. L., Hamilton, $1 ; Mechanics' Institute, Hamilton, $1 ; Rev. R. B., Hamilton, $2 ; A. M., Hamilton, $1 ; J. F., Hamilton, $1 ; W. H. M., Hamilton, $1 ; O. T. P., St. Catharines, $1 ; J. K., Galt, $1.75 ; C. H., Waterville, Me., $1 ; Soc. Nat. Hist., Boston, $10.38 ; A. L. G., Beachville, $1 ; J. C. F., New Albany, Ind., $1 ; J. A., Brooklyn, N.Y., $1 ; Dr. F. B. K., Reading, Mass., $1 ; Dr. S. A. S., Reading, Mass., $1 ; J. B., San Francisco, $2.13 ; A. J. C., $1 ; S. W., Cooksville, $1 ; J. H., West Farms, N.Y., $1 ; J. M. J., Halifax, $5 ; Rev. E. A. D., Baltimore, Md., $1 ; H. K. M., Boston, Mass., $1 ; A. M., England, $1.

EXCHANGES, &c.

Lepidoptera, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—Joseph E. Chase, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

AGENTS FOR THE ENTOMOLOGIST.

Canada.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

United States.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.